DRAFT Ecological risk assessment conceptual site model for the Portland Harbor Superfund Site
For internal discussion. Do not distribute.

Legend

- ● = Complete and significant pathway
- ○ = Complete and significance unknown
- **i** = Complete and insignificant pathway
- **x** = Incomplete pathway
- POTW = Publically owned treatment works
- bgs = below ground surface

Definitions

A **Complete** pathway means there is a potential for a contaminant to reach a receptor via the proposed route.

An **Incomplete** pathway means there is no potential for a contaminant to reach a receptor via the proposed route.

A **Significant** pathway means there is a high likelihood that a contaminant can reach effect levels via the proposed route.

An **Insignificant** pathway means there is a low likelihood that a contaminant can reach effect levels via the proposed route.

Significance Unknown means that it is unknown that a contaminant could reach an effect level via the proposed route alone. However, the contaminant might contribute to effect levels when combined with other pathways or other contaminants.

Complete and Significant

The following criteria should be met before the pathway of a contaminant should be considered complete and significant:

• The pathway is theoretically or potentially complete; pathway can be supported by the scientific literature .
• Both the receptor and the exposure media are known, based on site-specific information, or can reasonably be assumed to co-occur in Portland Harbor.
• The pathway has been shown to be a primary route of exposure for any life stage of a receptor or surrogate organism based on laboratory, field, or site-specific data, and contaminant concentrations can reach effect levels solely by the proposed route or pathway under evaluation.

For example, exposure of fish to dissolved metals via uptake through the gill, and exposure of fish-eating birds to PCBs by consuming contaminated prey.

Pathways that are complete and significant will be assessed quantitatively. For example, the concentration of metals measured in the water column will be compared to concentrations shown to cause adverse effects to fish (in the scientific literature) to calculate a hazard quotient. If information needed to calculate a hazard quotient is not available, the preference will be to collect the needed information. If the information cannot be collected, a conservative value will be used in the hazard quotient calculation.

Complete and Significance Unknown

A pathway should be classified as complete and significance unknown if it meets the following criteria:

• The pathway is theoretically or potentially complete; pathway can be supported by the scientific literature.
• Both the receptor and the exposure media are assumed to co-occur in the Portland Harbor, but it is unknown whether or not the receptor uses the area sufficiently enough to be exposed to contaminants at effect levels.
• The pathway has been shown to be a primary route of exposure for any life stage of a receptor or surrogate organism but no laboratory, field, or site-specific data are available indicting contaminant can reach effect levels
• It is unknown if concentrations of a contaminant will likely contribute to effect levels when combined with other pathways or contaminants.

For example, it is unknown how sturgeon use Portland Harbor. While exposure to sediment is likely, data are not available to assess quantitatively the extent that this receptor and exposure media co-occur.

For pathways that are classified as complete and significance unknown, additional site-specific data will be required to determine if they can be reclassified as complete and significant or complete and insignificant.

Complete and Insignificant

A pathway should be classified as complete and insignificant if it meets the following criteria:

• The pathway is theoretically or potentially complete; pathway can be supported by the scientific literature.
• The pathway is known to be a primary route of exposure for any life stage of a receptor or surrogate organism. However, laboratory, field, or site-specific data indicate contaminants are unlikely to reach effect levels solely by the proposed route or pathway under evaluation, or, it can be reasonably assumed that data would demonstrate that exposure via the pathway is insignificant compared to other pathways.

For example, while theoretically freshwater fish ingest water when feeding they do not actively drink due to the osmotic conditions in which they exist. Therefore, exposure to surface water via ingestion would be minor relative to other pathways. Also, PCB uptake from the water column is probably a complete pathway for piscivorous birds, but compared to the uptake of PCBs in contaminated prey items, the exposure is not significant.

Pathways that are complete and insignificant will not be assessed unless additional data become available that changes the significance value. Studies will not be specifically designed to address the complete and insignificant pathway combination. A hazard quotient will be calculated if data are readily available, and some pathway/receptor combinations could be described in the uncertainty section.

Incomplete

A pathway should be classified as incomplete if it meets the following criteria:

• The pathway is theoretically and/or practically not possible or not likely to occur in the area evaluated.
• Both the receptor and the exposure media are known, based on site-specific data, or can reasonably be assumed not to co-occur in Portland Harbor or would not use the area to the extent where exposure would occur.
• The pathway is not a primary route of exposure for any life stage of a receptor or surrogate organism based on laboratory, field, or site-specific data.

For example, juvenile salmon would not be eating fish.

Pathways that are incomplete will not be assessed.